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## THE STONE AGE IN NORTH AMERICA.

*The Stone Age in North America: an Archaeological Encyclopædia of the Implements, Ornaments, Weapons, Utensils, &c., of the Prehistoric Tribes of North America, with more than three hundred full-page plates and four hundred figures illustrating over four thousand different objects.* By W. K. Moorehead. Vol. i., pp. xii+457; vol. ii., pp. vi+417. (London: Constable and Co., Ltd.; Boston and New York: Houghton Mifflin Co., 1911.) Price, 2 vols., 1l. 11s. 6d. net.

MR. MOOREHEAD has produced two handsome volumes amply illustrated. They deal with a subject that has scarcely ever been treated as a whole. Special aspects of the use of stone by the older inhabitants of the American continent have formed the subject of monographs by Wilson, Abbott, Holmes, and others, but no one has ever ventured to deal with the entire field. Mr. Moorehead is an enthusiast for his subject, a condition of mind that inevitably lends a human interest to his book, while, almost as surely, it leads him into sundry exaggerations. He takes up the position of the strongly convinced advocate rather than that of the impartial judge. This attitude is one by no means uncommon in books produced in the United States on subjects depending upon induction and hypothesis, rather than upon observed facts. Nor is the attitude unknown in Europe; but the conditions differ in an important manner. On this side the literature of our prehistoric periods is already fifty years old; certain facts and a definite terminology have been generally accepted; the main grouping is again an accepted fact, and the result is that, to write intelligibly, the author of a new treatise is compelled to subscribe to these conditions. The common terminology may be right or wrong; it may, and often does, beg the question, but the system is practical, inasmuch as it enables the writer to state his arguments and the reader to understand them, without pausing to disentangle the meaning of the terms in which they are stated. The book can thus be read without impatience, and it may be with profit.

Now one of the perplexing features of the productions of the Stone ages is the marvellous similarity in form of the implements from the most widely separated districts. This is, of course, a commonplace, for everyone knows that, e.g., implements from South Africa, from the laterite beds of Madras, and, say, from Trenton, New Jersey, differ only in the material of which they are made. In the later neolithic times, such similarities are perhaps even more marked, and, in some ways, more astonishing, though, at the same time, each country has its characteristic forms.

This being the case, surely it would be wisdom, and tend to the elucidation of the problems of early man, if the writers of new treatises would endeavour to make their local discoveries fall into line with the scheme already accepted in Europe—if they would master and adopt the classification to be found in the text-books of the subject. It is not claimed for a moment that

the scheme or the classification is perfect, or even that it is the last word, but only that it exists, and is generally adopted, while in addition, it is the considered judgment of a great number of men who have given their lives to the study. Mr. Moorehead and his committee, who five years ago undertook the classification on which his book is founded, do not appear to have given any thought to this aspect of the question, and have treated North America as archaeologically independent of the rest of the ancient world. From one point of view they are certainly justified. In the United States the Stone age was in existence so recently that both the methods of manufacture and the purpose of many stone implements are matters of fact. Here the field is their own, and they need no external help, but in the main we have no hesitation in saying that conformity with European scholars would have been better.

While we have thought it desirable to formulate this objection to Mr. Moorehead's method, we can commend the matter of his book. It is called an encyclopædia, and the term is not inaccurate, for it comprehends practically all the types of later stone tools found in Northern America. Its intention is to supplement the very remarkable "Handbook of American Indians," published by the Smithsonian Institution in 1907. This work, reasonably enough, did not treat the Stone age as a special subject, and hence the complement now before us was produced. One cannot but regret that no place has been found in these volumes for a complete statement of the evidence as to the discoveries of Mr. Abbott at Trenton, New Jersey. Controversy raged fiercely at the time, and weighty opinions were to be found on both sides. A book with this title should certainly have dealt with the matter.

It may appear surprising to us that the discoveries in the mounds of America, of stone implements, pottery, and the like, are disclaimed by the existing Indians, though a comparison of the relics with those in use by the Indians until late years shows them to be very similar.

Such disclaimers are, however, common enough among primitive peoples. The negroes of West Africa will have nothing to say to the stone implements and images dug up in their plantations. It is probable enough that even if one or the other possessed either history or trustworthy tradition, they would equally disclaim any knowledge of the remains. In Africa the pressure of a superior civilisation from the East and North has produced a constant shifting of the tribes during, say, the last two thousand years. During the same period, or even less, economic and other causes must have created something like a nomadic condition in North America. For these reasons it might well be that the existing tribes on a particular spot would know nothing of the origin of the ancient burial places among which they lived.

One feature in connection with North American stone implements that is clearly brought out in Mr. Moorehead's illustrations is the astonishing likeness between some of them and others from Mexico. On p. 93 of vol. i. may be seen a group from Kentucky showing this similarity very strongly. The likeness

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would not seem to be due to utilitarian causes, but rather to an artistic tradition. This is interesting in itself, but it also has a bearing on another point, perhaps even more interesting. On p. 162 of vol. i. is a curious group of chipped implements, some of them in the form of human profiles, while others are axes with curved sides expanding to a crescent-shaped cutting edge. It is well known that in passing from the use of stone to that of metal (often copper) the earliest metal axes are accurate copies of the stone type. Experience soon showed that hammering of the copper edge not only sharpened it, but, very naturally, widened it also, so that the natural result of the process was to produce a rounded cutting edge, with a curve from its two sides towards the butt. This resulting form, being at once more practical and more elegant, in turn became the type of copper or bronze axe.

These two facts, the presence of Mexican stone types, as well as types founded on a cast-metal prototype, in American Indian settlements, may well lead one to consider whether both one and the other had an origin further south than the United States. It may be contended that copper implements are common enough in the United States, and that there is no need to look further. But it is not of so much importance that the prototype should be of metal; it is that it should be of *cast* metal.

These are some of the many questions that are raised by the perusal of Mr. Moorehead's elaborate work. We can congratulate him on its encyclopædic character, a useful feature. The amount of material is amazing, and the exquisite implements from Tennessee in the Missouri Historical Society's museum will be a surprise to most people on this side. We could have wished that he had placed his figures somewhat nearer the text relating to them, and that his index had been a little better.

#### THE VULCANICITY OF OUR EARTH.

*Die vulkanischen Erscheinungen der Erde.* By Dr. K. Schneider. Pp. viii + 272. (Berlin: Gebrüder Borntraeger, 1911.) Price 12 marks.

DR. SCHNEIDER opens his work by reference to what is found in many books on vulcanology and geology, namely, the part played by volcanic activities in the economy of nature. In consequence of volcanic action minerals of high specific gravity are brought to the surface, the contours between land and water may be changed, and new islands may be created. Since Tertiary times 3'96 mill. km.<sup>2</sup> of land surfaces have been covered by volcanic ejecta. These accumulations have altered relative altitudes, on which climate, plant life, and other things depend. Valleys have been blocked, lakes formed, and river courses have been changed. At the time of an eruption a variety of gases and chemical products are brought to the surface, and many mineral deposits are closely associated with volcanic action. Although in many ways volcanoes have been beneficial to humanity, in their immediate vicinity they have been frequently associated with the loss of life and property. Volcanic explosions have excited the imagination, given rise to

myths concerning subterranean deities or monsters, and indirectly have had an effect on literature and art.

At present we are told that on the surface of our world there is one active volcano to 1420475'5km.<sup>2</sup>

We can regard volcanoes from a geographical, petrographical, chemical, and other points of view, and what has been done in each of these directions is briefly reviewed. The notes relating to the temperatures of lava and the average depth at which a rapid change might be expected in materials similar to those we meet with on the surface of our earth might easily have been extended.

Dr. Schneider's classification of volcanoes depends on their forms, and of these there are seven types. The names given to these types were quite as startling to me as was the word anhydrohepseption when I first heard it. It turned out to be a saucepan in which you can cook potatoes without water.

*Pedioniten* are fissure outflows like the Deccan Traps. *Aspiten* are characterised by the relationship of their height to an extended base, as, for example, Mauna-Loa. *Tholoiden* refer to forms with a gentle sloping base which runs inland from a coast and then suddenly rises with convex flanks to a rounded summit. *Beloniten* are illustrated by the needle-like peak of Mount Pelée. *Koniden*: these are mountains the flanks of which are convex-concave. A slight reference is made to this logarithmic curvature of volcanic profile which was first noticed in connection with Mount Fuji, but the lesson it teaches respecting the height of a mountain and the area of its base in relation to the material out of which it is formed, has apparently escaped notice. The relation of form to the size of ejectamenta, friction, wind, and the character of an eruption has not been overlooked. *Homaten*. In these the slope rises directly from the coast to the summit as in Hverfjell in Iceland. *Maare*. Here the volcanic neck has risen to the surface, clastic material has been spread widecast, and flat hollows have been created similar to those in the crater lakes in the Eifel. Each of these types can also be found in the moon, and on our earth consists of materials with different physical structures. *Rheumatisches* material is that which flows like lava. The other materials may be clastic like lapilli and ash, gaseous and aqueous. Tertiary volcanoes are characterised by the prevalence of materials first referred to, whilst the materials of recent volcanoes are more clastic.

A chapter of considerable interest to geologists is one which gives an outline of volcanic action in Europe since Tertiary times. This, however, does not entirely overlook the vulcanicity which took place in earlier periods. The number of active volcanoes in the world during the Diluvium-alluvium period is estimated at 1081, whilst during historical times only 201 can be counted. These latter are grouped along great lines of dislocation in the larger features of the earth's crust. They do not occur in rows, but in relatively small zones. These are two out of eight laws formulated in connection with the geographical distribution of volcanoes, which is illustrated by numerous maps. The volume concludes with a catalogue of 367 volcanoes which have been active during